



# Temperature Converter with Trip Values

## KFD2-GUT-1.D

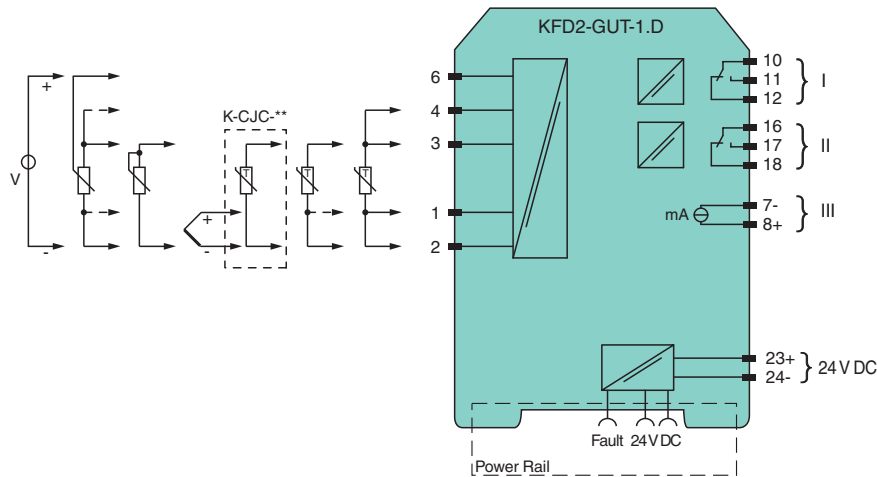
- 1-channel signal conditioner
- 24 V DC supply (Power Rail)
- Thermocouple, RTD, potentiometer or voltage input
- Redundant TC input
- Current output 0/4 mA ... 20 mA
- 2 relay contact outputs
- Configurable by PACTware or keypad
- Line fault (LFD) and sensor burnout detection
- Up to SIL 2 acc. to IEC/EN 61508 / IEC/EN 61511

# CE SIL2

### Function

This signal conditioner provides the galvanic isolation between field circuits and control circuits. The device converts the signal of a resistance thermometer, thermocouple, potentiometer, or voltage source to a proportional output current. It also provides a relay trip value. The removable terminal block K-CJC-\*\* is available as an accessory for internal cold junction compensation of thermocouples. A fault is signaled by LEDs acc. to NAMUR NE44 and a separate collective error message output. The device is easily configured by the use of the PACTware configuration software. For additional information, refer to the manual and [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

### Connection



### Technical Data

| General specifications               |  |
|--------------------------------------|--|
| Signal type                          | Analog input                                       |
| Functional safety related parameters |  |
| Safety Integrity Level (SIL)         | SIL 2  |
| Supply                               |  |
| Connection                           | terminals 23+, 24- or power feed module/Power Rail |
| Rated voltage                        | $U_r$ 20 ... 30 V DC                               |
| Rated current                        | $I_r$ approx. 100 mA                               |
| Power dissipation/power consumption  | $\leq 2$ W / 2.2 W                                 |

Release date: 2023-01-03 Date of issue: 2023-01-03 Filename: 231224\_eng.pdf

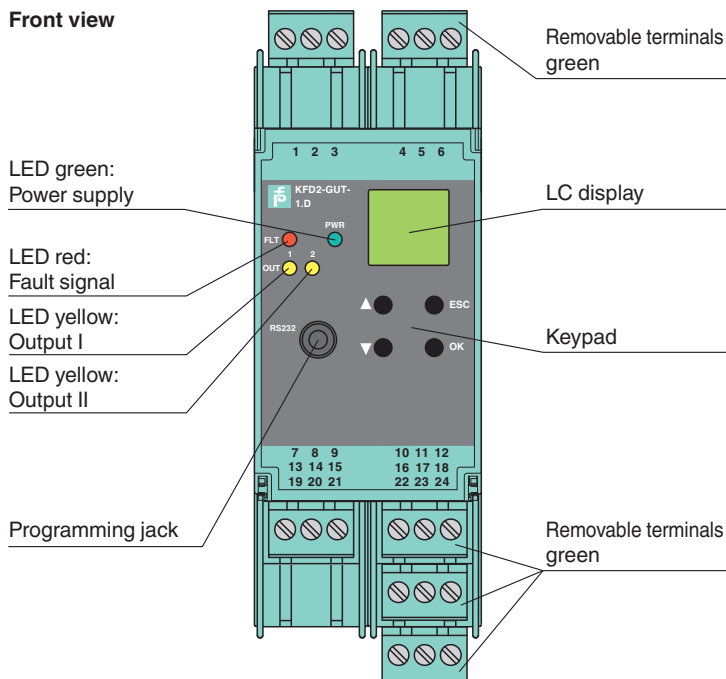
## Technical Data

| <b>Interface</b>                             |   |
|--|---|
| Programming interface                        | programming socket  |
| <b>Input</b>                                 |   |
| Connection side                              | field side  |
| Connection                                   | terminals 1, 2, 3, 4, 6   |
| RTD  | Pt100, Pt500, Pt1000, Ni100, Ni1000   |
| Measuring current                            | approx. 400 $\mu$ A   |
| Types of measuring                           | 2-, 3-, 4-wire technology   |
| Lead resistance                              | max. 50 $\Omega$  |
| Measurement loop monitoring                  | sensor breakage, sensor short-circuit   |
| Thermocouples                                | type B, E, J, K, L, N, R, S, T (IEC 584-1: 1995)  |
| Cold junction compensation                   | external and internal   |
| Measurement loop monitoring                  | sensor breakage   |
| Potentiometer                                | 0.8 ... 20 k $\Omega$   |
| Types of measuring                           | 2-, 3-, 5-wire technology   |
| Voltage                                      | 0 ... 10 V, 2 ... 10 V, 0 ... 1 V, -100 ... 100 mV  |
| Open loop voltage                            | max. 5 V with resistance measuring sensor   |
| Input resistance                             | $\geq$ 250 k $\Omega$ (0 ... 10 V)<br>min. 1 M $\Omega$ (0 ... 1 V, -100 ... 100 mV)              |
| <b>Output</b>                                |   |
| Connection side                              | control side  |
| Connection                                   | output I: terminals 10, 11, 12<br>output II: terminals 16, 17, 18<br>output III: terminals 8+, 7- |
| Output I, II                                 | relay   |
| Contact loading                              | 250 V AC / 2 A / $\cos \phi \geq 0.7$ ; 40 DC / 2 A   |
| Mechanical life                              | 5 x 10 <sup>7</sup> switching cycles  |
| Energized/De-energized delay                 | approx. 20 ms / approx. 20 ms   |
| Output III                                   | Analog current output   |
| Current range                                | 0 ... 20 mA or 4 ... 20 mA  |
| Open loop voltage                            | max. 24 V DC  |
| Load   | max. 650 $\Omega$   |
| Fault signal                                 | downscale I $\leq$ 3.6 mA, upscale I $\geq$ 21 mA (acc. NAMUR NE43)                               |
| Collective error message                     | Power Rail  |
| <b>Transfer characteristics</b>              |   |
| Deviation                                    |   |
| Temperature effect                           | Input: 0.005 %/K (50 ppm) of span ; current output: 0.005 %/K (50 ppm) of span                    |
| RTD  | max. 0.2 % of span  |
| Thermocouples                                | max. 10 $\mu$ V<br>deviation of CJC: $\pm$ 0.8 K  |
| Voltage                                      | 0.1 % of span   |
| Potentiometer                                | 0.1 % of span when < 5 k $\Omega$<br>0.5 % of span when > 5 k $\Omega$                            |
| Current output                               | max. 20 $\mu$ A   |
| Sampling rate                                | approx. 700 ms  |
| <b>Galvanic isolation</b>                    |   |
| Input/Other circuits                         | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>  |
| Output I, II against each other              | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>  |
| Output I, II/other circuits                  | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>  |
| Output III/power supply and collective error | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>  |
| Interface/power supply                       | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>  |
| <b>Indicators/settings</b>                   |   |
| Display elements                             | LEDs , display  |
| Control elements                             | Control panel   |

**Technical Data**


|                                  |   |
|----------------------------------|---|
| Configuration                    | via operating buttons<br>via PACTware   |
| Labeling                         | space for labeling at the front   |
| <b>Directive conformity</b>      |   |
| Electromagnetic compatibility    |   |
| Directive 2014/30/EU             | EN 61326-1:2013 (industrial locations)  |
| Low voltage                      |   |
| Directive 2014/35/EU             | EN 61010-1:2010   |
| <b>Conformity</b>                |   |
| Electromagnetic compatibility    | NE 21:2007  |
| Degree of protection             | IEC 60529:2001  |
| <b>Ambient conditions</b>        |   |
| Ambient temperature              | -20 ... 60 °C (-4 ... 140 °F)   |
| <b>Mechanical specifications</b> |   |
| Degree of protection             | IP20  |
| Connection                       | screw terminals   |
| Mass                             | 300 g   |
| Dimensions                       | 40 x 119 x 115 mm (1.6 x 4.7 x 4.5 inch) (W x H x D) , housing type C2  |
| Mounting                         | on 35 mm DIN mounting rail acc. to EN 60715:2001  |
| <b>General information</b>       |   |
| Supplementary information        | Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> . |

**Assembly**











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**Matching System Components**

|   |                                 |  |
|---|---------------------------------|--|
|  | <b>DTM Interface Technology</b> | Device type manager (DTM) for interface technology |
|---|---------------------------------|--|

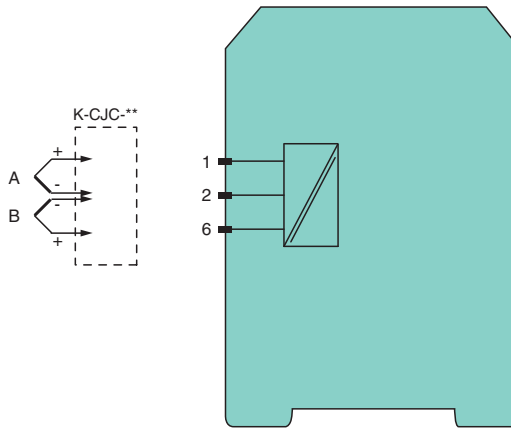
## Matching System Components

|   | PACTware 5.0            | FDT Framework   |
|---|-------------------------|---|
|  |                         |   |
|  | <b>K-ADP-USB</b>        | Programming adapter with USB interface  |
|  | <b>KFD2-EB2</b>         | Power Feed Module   |
|  | <b>UPR-03</b>           | Universal Power Rail with end caps and cover, 3 conductors, length: 2 m       |
|  | <b>UPR-03-M</b>         | Universal Power Rail with end caps and cover, 3 conductors, length: 1,6 m     |
|  | <b>UPR-03-S</b>         | Universal Power Rail with end caps and cover, 3 conductors, length: 0.8 m     |
|  | <b>K-DUCT-GY</b>        | Profile rail, wiring comb field side, gray                                    |
|  | <b>K-DUCT-GY-UPR-03</b> | Profile rail with UPR-03-* insert, 3 conductors, wiring comb field side, gray |

## Accessories

|   |                  |  |
|---|------------------|--|
|  | <b>K-250R</b>    | Measuring resistor   |
|  | <b>K-500R0%1</b> | Measuring resistor   |
|  | <b>K-CJC-BK</b>  | Terminal block for cold junction compensation, 3-pin screw terminal, black |
|  | <b>KF-ST-5GN</b> | Terminal block for KF modules, 3-pin screw terminal, green                 |
|  | <b>KF-CP</b>     | Red coding pins, packaging unit: 20 x 6                                    |

**Application**



**Redundant thermocouple**

For higher availability it is possible to connect a second redundant thermocouple (B) of the same type to the temperature converter. The cold junction temperature is taken from the connected terminal block.

If the deviation of the both thermocouples (A and B) exceed the selected tolerance, an error will occur. If a lead breakage of one thermocouple (e. g. A) has been detected, an error message occurs and the value of the second thermocouple (B) will be taken for further calculation.

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